

**REMARKS**

Claims 1-69 are pending and under examination. In this amendment claims 1-2, 11, 14, 31, and 57 are amended, and claims 3, 4, 6, 13, 17, and 58 are cancelled without prejudice to future prosecution.

In Applicants' last response, no claims were amended and all rejections were overcome and were withdrawn. In this second non-final Office Action the previously examined claims stand newly rejected as allegedly not in compliance with 35 USC 112, para. 2. The claims were rejected for allegedly being incomplete for omitting essential structural cooperative relationships of elements. Applicants respectfully disagree, but to expedite prosecution Applicants have amended the claims to address the concerns of the Office. No disclaimer or change in scope of the claims is intended by these clarifying amendments.

As an initial matter Applicants note that in the most recent Office Action the claims seemed to have been read in isolation and without benefit of the specification. During patent examination, claims must be interpreted in a fashion consistent with the specification. That is, although Applicants agree that claims may not omit essential structural cooperative relationships of elements, equally the Office may not ignore the meanings of terms and other teachings of the specification in evaluating whether the language of the claims is clear and definite and would be understood by one of ordinary skill in the art.

Turning to the rejections, in claim 1 it was alleged to be unclear as to how the microvalves are situated within the device. Specifically, the Office asks whether the microvalves are positioned within the loop channel or within the service channels. As discussed by Applicants in previous responses, a loop channel is a channel that can be temporarily isolated from other channels to form a closed path through which fluid may be actively circulated. Insofar as claim 1 indicates that when said microvalves are closed said loop channel is a closed path, one of skill reading the specification would recognize that these microvalves cannot be positioned so that when closed they completely block the loop channel and thereby prevent

circulation of fluid through the loop channel. For additional clarity, claim 1 has been amended to recite that each service channel comprises a microvalve that when closed separates the service channel and the loop channel wherein when said microvalves are closed said loop channel is a closed path.

The Office also states it is unclear whether the pump is "associated internal to the device or connected via an external connection to the loop channel." The pump circulates fluid through the closed path of the loop channel, as explained in detail in the specification. To expedite prosecution, claim 1 has been amended to specify that the pump is a peristaltic pump comprising at least three cooperating microvalves acting within the loop channel. Peristaltic pumps are described in the specification (see, e.g., Figures 14 and 15 and corresponding text). As is explained in the specification the at least three microvalves can be opened and closed in a series or cycle, to create a pumping action in the target loop. See Fig. 14. Also see the specification at page 2, lines 5-7. It is further specified that the pump microvalves comprise an elastomeric membrane. Elastomeric microvalves and pumps comprising elastomeric microvalves are well known in the art and are described in the specification. The amendments to claim 1 are supported in the specification. As amended, claim 1 also incorporates elements from claims 3, 4 and 13.

The *pump* of claim 57 was asserted to be unclear for same reasons as asserted for claim 1. Claim 57 has been amended and Applicant's response to the rejection of claim 1 also addresses the issues raised in claim 57.

Concerning claim 31 the Office states it is unclear as to how the elastomeric fluid channels structurally comprise the loop channel. This rejection seems to arise from a misunderstanding of terminology. The loop channel *is* an elastomeric fluid channel. Similarly, the loop inlet and loop outlet channels of claim 31 are elastomeric fluid channels. Claim 31 clearly sets forth that the elastomeric fluid channels of the treatment layer include a loop channel,

a loop inlet channel and a loop outlet channel. Thus, Applicants submit the claim is clear and complete.

The Office also asks, are the control channels of claim 31 in fluidic communication with the elastomeric fluid channels? In claim 31, control channels lie in a control layer adjacent to the treatment layer. The control channels are not in fluidic communication with the elastomeric fluid channels. The control channel "intersects" a fluidic channel (in an adjacent plane) to form a microvalve. "Intersects," as used in this context means that the control channel in the control layer crosses over a fluid channel in the adjacent treatment layer. As explained a microvalve is formed by the elastomeric membrane separating a fluid channel in one layer and the control channel in an adjacent layer, where the fluid channel and control channel cross. Pressurized gas (or other fluid) in a control line can selectively deflect or release the interchannel membrane, to close or open the microvalve and restrict or permit flow in the adjacent cooperating fluid channel. "Control channels" are clearly described in the specification and are well known in the art. If the claims, read in light of the specification, reasonably apprise those skilled in the art both of the utilization and scope of the invention, and if the language is as precise as the subject matter permits, the statute (35 U.S.C. 112, second paragraph) demands no more. Applicants respectfully submit that claim 31 is perfectly clear when read in light of the specification.

Claim 60 was asserted by the Office to be unclear for the same reasons as claim 31. Claim 60 recites a device with a plurality of loop channels where at least three control channels intersect each loop channel to form a peristaltic pump. Applicant's response concerning claim 31 also address the issues raised in relation to claim 60.

### ***Request for Interview***

Should the Office have any additional concerns about the clarity of the claims, it is requested he contact the undersigned to efficiently resolve any remaining issues. It is believed than any additional issues of clarity can be addressed in an interview.

**CONCLUSION**

In view of the foregoing, Applicants believe all claims now pending in this Application are in condition for allowance and an action to that end is respectfully requested.

If the Examiner believes a telephone conference would expedite prosecution of this application, please telephone the undersigned at 650-462-5330.

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Respectfully submitted,



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